Simplex®

4004 Fire Alarm

Installation/Operation Instructions

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Rev. C

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Table of Contents

Chapter 1 4004 System Overview

Overview 1-1
Environmental 1-2
Ground 1-2
Power Input 1-2
Battery Standby 1-2
4004 System Features 1-2
4004 System Diagram 1-3

Chapter 2 Requriments and Accessories

Regulatory Requirments 2-1
Installation Requirements 2-2
Optional Accessories 2-2

Chapter 3 Installation

Requirments 3-1
Back Box 3-1
Wiring 3-2
System Modules 3-2
Jumper Settings/Service Switches 3-9
Programming Instructions 3-11

Chapter 4 Operating Instructions

Front Panel Operation 4-1
Operator Key Definitions 4-1
System Initialization (Power-Up) 4-3
Supervisory Conditions 4-4
Walk Test 4-4
System Testing (Fire Drills) 4-4
Emergency Operating Instructions 4-5

Chapter 5 Glossary of Terms

Chapter 6 4004 Battery Selection

Battery Selection 6-1
Battery Selection Calculation 6-2

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Chapter 1
4004 System Overview

Overview

The 4004 Fire Alarm Control Panel (FACP) is a general alarm, battery-backed, electrically supervised system capable of operating two Notification Appliance Circuits (NACs) and monitoring two Initiating Device Circuits (IDCs) with expansion capability of up to 8-IDCs. The 4004 FACP is capable of automatically controlling auxiliary equipment such as fire doors and fans during a fire condition. The 4004 provide audible and visible indications during Fire Alarm, Supervisory, or Trouble conditions. If any of these conditions occur, the system sounds the appropriate notification appliance(s) and flashes the applicable display (the red "FIRE ALARM ZONE" display for fire alarm zone indication, the yellow "TROUBLE" display for trouble indication, and the yellow LED for "Supervisory" operation).

- Acknowledging the alarm immediately silences the panel audible and causes the display to illuminate steadily.
- Pressing the "SYSTEM RESET" key resets the system and causes the seven-segment alarm and trouble displays to indicate a dash (-) for 15-seconds; following the dash, the displays go out on a successful system reset or indicate an existing Alarm, Supervisory, or Trouble Condition(s).

The 4004 system has "Re-sound" capability. Following a Supervisory alarm or trouble acknowledgment, another circuit goes into alarm, supervisory, or trouble; the applicable display flashes; and the signals again operate. Once in alarm, the system remains in alarm until the device that initiated the alarm is restored to normal and the panel is reset.

The FACP constantly checks for electrical troubles (power loss, battery problems, wiring faults, etc.). If a Trouble occurs, the tone-alert sounds and the yellow trouble display indicate the type of trouble(s) in the system. Another selectable 4004 feature is an active status reminder, if there is an acknowledged alarm, supervisory, or trouble condition in the system, the tone-alert sounds every eight hours for five seconds.

Figure 1 illustrates the physical layout of the cards and the power-limited and non power-limited wiring areas within the 4004. Printed circuit boards are joined together in the system by board-to-board connectors or via a wiring harness connection.

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Environmental

The 4004 is designed to operate in the following conditions:

- 32 - 120° F /0 - 49° C
- UL - 85% relative humidity (non-condensing)
  ULC - 93% relative humidity (non-condensing)

Ground

The 4004 FACP must be grounded properly. Readings of less than 0.70 VAC must be measured between ground and neutral. A system ground needs to be provided for Earth Detection and transient protection devices. This connection must be made to an approved, dedicated Earth connection per NFPA 70, Article 250, and NFPA 78. To ground the 4004, connect a 12 AWG copper ground wire from safety ground (electrical distribution panel) to the green grounding screw on the FACP.

Power Input

The 4004 system is designed for either 120 VAC, 60 Hz or 220/240VAC, 50/60 Hz.

Battery Standby

The battery standby provides for power loss connections. The batteries mount in the 4004 control panel and provide at least 60 hours of standby operation for a fully configured system.

Note: 60 hours of standby operation is based on using 10 Ah batteries, without four-wire detectors or other non-alarm loads attached to the system, followed by five minutes in alarm. A fully configured system using 6.2 Ah batteries, without four-wire detectors or other non-alarm loads attached to the system, provides at least 24 hours of standby operation, followed by five minutes in alarm.

4004 System Features

- Expandable from two to a maximum of 8-IDCs
- 2 Notification Appliance Circuits (NACs)
- 4 Amps of Power to meet ADA Requirements
- Surface or Semi-Flush Installation
- Single Piece Chassis
- Zone (IDC) Disconnect Switches with Abort Enable Features
- Alarm Output Disconnect Switch
- One Person Walk Test
- Chronological Event Display
- Indicator (Lamp) Test Feature
- Low and Depleted Battery Detection
- Active Status Reminder
- Non-volatile Memory
- 5-IDC Point Type Selections
- Six Alarm Silence Inhibit Timer Selections
- Four Auto-Silence Timer Selections
- Four Coded Signal Selections
- Available with Optional
  - City Circuits
  - Class A (Style D/Style Z) Converters
  - Full Function Remote Annunciator Interface
  - Simplex 4003 Voice Control Panel and 4009 NAC Extender

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4004 System Diagram

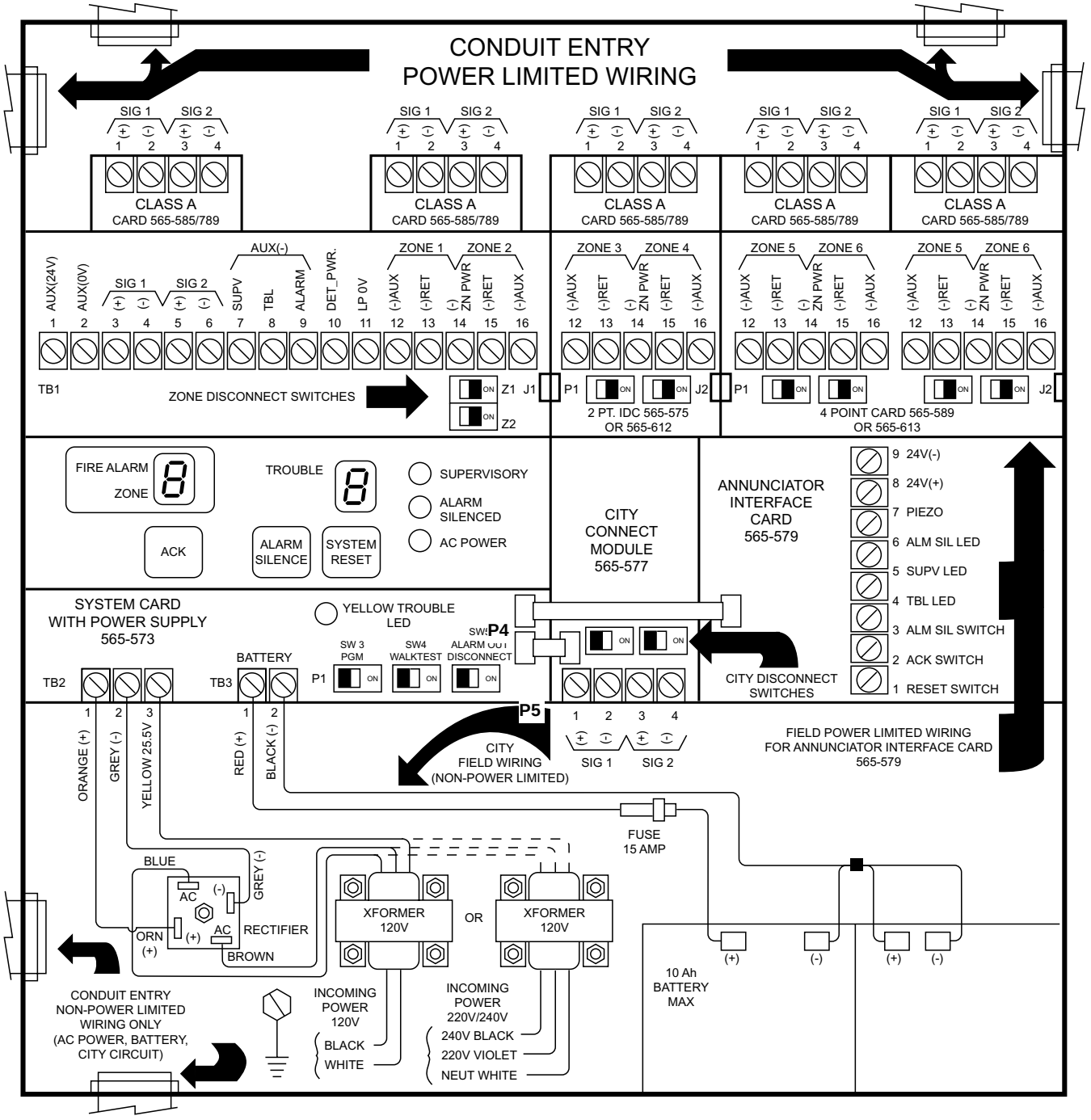

Figure 1. 4004 System Diagram

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Chapter 2
Requirements and Accessories

Regulatory Requirements

NFPA Standards

The 4004 Fire Alarm System is listed/approved for the following listing categories:

Listed to UL Standard 864 for the following system types:

- UL 864 Power-Limited Fire Alarm Control Unit.
- Local (formerly NFPA 72A).
  Requires the sounding of an alarm via the listed notification appliance(s).
- Auxiliary (formerly NFPA 72B).
  Requires the 4004-9809 City Circuit Module.
- Remote Station - protected premise (formerly NFPA 72C).
  Requires the 4004-9809 City Circuit Module or the 4004-9810 DACT.
- Proprietary - protected premise (formerly NFPA 72D).
- Central Station - protected premise (formerly NFPA 71).
  Requires the 4004-9810 DACT.

UL 864 Listings for Type of Service:

- Automatic, Manual, Waterflow, and Sprinkler Supervisory.

UL 864 Listings for Type of Signaling:

- Coded, Non-Coded, March-Time, and DACT.
  Requires the 4004-9810 DACT.

Factory Mutual Approved

- Same as UL above.
- Intrinsically Safe - requires 2081-9036 intrinsically safe module.

Local/Regional Approvals

- CSFM
- MEA

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Installation Requirements

Most NFPA Codes and Standards referenced publications are listed below. You must be familiar with codes, as well as any applicable local codes and standards, when installing a fire alarm system.

- **NFPA 72 -** National Fire Alarm Code
- **NFPA 11 -** Standard for Low-Expansion Foam and Combined Agent Systems
- **NFPA 11A -** Standard for Medium- and High-Expansion Foam Systems
- **NFPA 12 -** Standard on Carbon Dioxide Extinguishing Systems
- **NFPA 12A -** Standard on Halon 1301 Fire Extinguishing Systems
- **NFPA 13 -** Standard for the Installation of Sprinkler Systems
- **NFPA 15 -** Standard for Water Spray Fixed Systems for Fire Protection
- **NFPA 16 -** Standard for the Installation of Deluge Foam-Water Sprinkler and Foam-Water Spray Systems
- **NFPA 16A -** Standard for the Installation of Closed-Head Foam-Water Sprinkler Systems
- **NFPA 17 -** Standard for Dry Chemical Extinguishing Systems
- **NFPA 17A -** Standard for Wet Chemical Extinguishing Systems
- **NFPA 25 -** Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
- **NFPA 70 -** National Electrical Code
- **NFPA 80 -** Standard for Fire Doors and Fire Windows
- **NFPA 90A -** Standard for the Installation of Air Conditioning and Ventilation Systems
- **NFPA 90B -** Standard for the Installation of Warm Air Heating and Air Conditioning Systems
- **NFPA 92A -** Recommended Practice for Smoke-Control Systems
- **NFPA 92B -** Guide for Smoke Management Systems in Malls, Atria, and, Large Areas
- **NFPA 101 -** Life Safety Code
- **NFPA 170 -** Standard for Fire Safety Symbols
- **NFPA 231C -** Standard for Rack Storage of Materials
- **NFPA 1221 -** Standard on the Installation, Maintenance, and Use of Public Fire Service Communication Systems

Optional Accessories

4003 Series Voice Control Panel - Provides voice communication capability to the 4004 Life Safety System.

4009 Series NAC Power Extender - Provides additional power and Notification Appliance Circuits to the 4004 Life Safety System.

4601 Series Annunciators - Provides remote Annunciation/Control of the 4004 Life Safety System.

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Chapter 3
Installation

IMPORTANT: Notify appropriate personnel (building occupants, fire department, or monitoring facility, etc.) of the installation. Before beginning installation, ensure that you are thoroughly familiar with these instructions and all applicable regulatory requirements. (Refer to Chapter 2 - *Requirements and Accessories*.)

Requirements

The following tools and equipment are required for 4004 installation:

- 1/4-inch Flat-Tip Screwdriver
- Volt-Ohmmeter
- Diagonal Cutting Pliers
- Wire Strippers
- End-of-Line Resistors (supplied by Simplex)
- The 841-992 Field Wiring Diagram

The installer is responsible for safeguarding all 4004 material shipped to the job site. During system installation, store all 4004 items (including all documentation) in a clean, dry, and safe place until needed.

Back Box

1. Remove the back box from the shipping container and lay it on a flat surface.
2. Using the information in Figure 2 as a reference, install the back box.
   - For specific internal wiring directions, refer to Figure 2 and the 841-992 Field Wiring Diagram.

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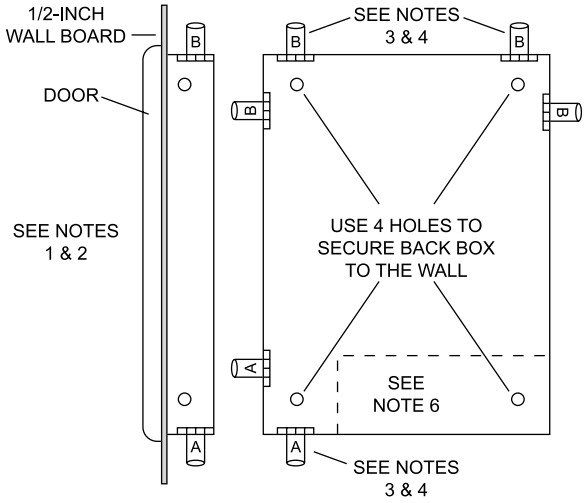
Back Box *(Continued)*

Description	Weight (See Note 5)		Height		Width		Rough Opening (See Note 2)	
Size	**Box**	**Door**	**Box**	**Door**	**Box**	**Door**	**Height**	**Width**
4004	6.5 lb	3.5 lb	16-1/8 in.	17 in.	14-1/2 in.	16-1/8 in.	16-1/8 in.	14-1/2 in.

CAUTION: Enclosure must be level and plumb when installing the back box.



Notes:

1. **The box can be mounted semi-flush with the surface of the wall (the cabinet protrudes approximately 3/8").**
2. **Dimensions shown are typical for all surface and semi-flush installations. Use rough opening dimensions preparing semi-flush installation.**
3. **"A" conduit denotes non-power limited wiring *only*. "B" conduit denotes power-limited wiring *only*.**
4. **When providing additional conduit entrances to the box use a suitable knockout punch to provide separate entrances for power-limited and non-power limited wiring at the opposite ends of the box. Check system label on door for power-limited information.**
5. **Box weight in pounds (without batteries).**
6. **This space must be kept free of wiring for battery installation.**

Figure 2. Back Box Mounting

Wiring

See the interconnect wiring diagram in Figure 3 for basic information on 4004 system wiring. For detailed wiring information, including circuit loading capacities, distance specifications, and wire size, refer to Figure 1 and the 841-992 Field Wiring Diagram (supplied with the FACP).

System Modules

The Base 4004 System [565-691] consists of:

A System Board with 2-IDCs and 2-NACs - Each IDC on the system board is capable of supporting up to 30 compatible two-wire detectors. Alarm verification is supported, with current-limited alarms being verified. Contact closure results in an immediate alarm. Support for Style D (Class A) IDCs is via an expansion module. A zone disconnect switch is provided for each IDC. When restoring a zone to the operative state, activation of notification circuits is inhibited for 15-seconds. The system sounder and display is not delayed if the restored zone is in the alarm state. This allows the operator or service technician to restore the IDC to the disabled state without a general alarm. This operation is called "Abort Enable" of the IDC. The selectable IDC types allow the user to define each zone as Fire Monitor, Alarm Verification, Fire/Supervisory, Trouble, and Style C (See the *Programming Instructions* section of this chapter).

Continued on next page

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System Modules *(Continued)*

The selectable IDC types are as follows:

Fire Monitor - For this point type, an alarm is defined as a direct short or current-limited condition across the initiating device circuit. An open circuit is a trouble condition.

Alarm Verification - This point type causes an immediate alarm with a direct short across the IDC. If current-limited circuit condition exists, the alarm verification sequence is started. An open circuit is a trouble condition.

Fire/Supervisory - This point type initiates a supervisory service condition at the fire alarm control panel if a current-limited state is detected. A direct short is an alarm. An open circuit is a trouble condition. The supervisory status latches until cleared and reset. If a short circuit or an open circuit occurs before the supervisory status clears, the supervisory indicators remain on until "SYSTEM RESET" is pressed and the point is normal.

Trouble - This point type does not cause a fire alarm in the system. A short, current-limited condition or an open circuit results in trouble. Most trouble conditions in the system clear automatically when the abnormal condition is corrected. "SYSTEM RESET" is not required except on Class A circuit Troubles.

Style C - Style C IDCs indicate a trouble if an open circuit or short circuit condition is present on the zone loop. A current limited condition causes an alarm.

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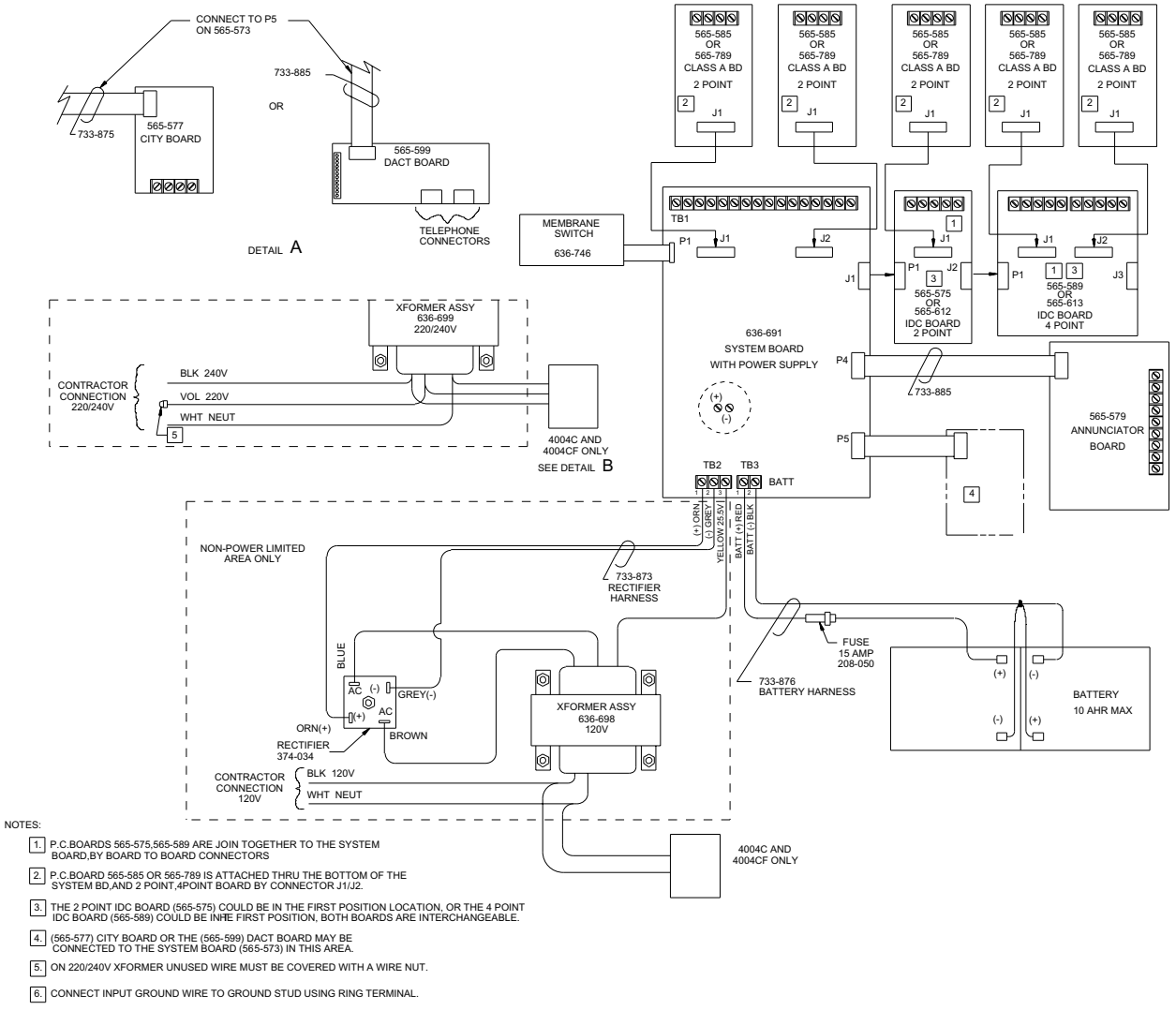
System Modules *(Continued)*



NOTES:

1. P.C.BOARDS 565-575,565-589 ARE JOIN TOGETHER TO THE SYSTEM BOARD,BY BOARD TO BOARD CONNECTORS
2. P.C.BOARD 565-585 OR 565-789 IS ATTACHED THRU THE BOTTOM OF THE SYSTEM BD,AND 2 POINT,4POINT BOARD BY CONNECTOR J1/J2.
3. THE 2 POINT IDC BOARD (565-575) COULD BE IN THE FIRST POSITION LOCATION, OR THE 4 POINT IDC BOARD (565-589) COULD BE IN THE FIRST POSITION, BOTH BOARDS ARE INTERCHANGEABLE.
4. (565-577) CITY BOARD OR THE (565-599) DACT BOARD MAY BE CONNECTED TO THE SYSTEM BOARD (565-573) IN THIS AREA.
5. ON 220/240V XFORMER UNUSED WIRE MUST BE COVERED WITH A WIRE NUT.
6. CONNECT INPUT GROUND WIRE TO GROUND STUD USING RING TERMINAL.

Figure 3. 4004 Interconnect Wiring Diagram

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System Modules *(Continued)*

The two NACs available with the base 4004 panel are rated at 2-amperes at 24-volts for each circuit. Power-limiting is from the 4004 system power supply. Additional NACs are added using the 4009 NAC Power Extender. The 4004 is a general alarm system, meaning that both NACs are energized on any alarm. Selection of "On Until Silenced" or "On Until Reset" is possible using jumper switch settings (see the section in this chapter titled "*Jumper Settings/Service Switches*). If coding operation is selected, only "On Until Silence" NACs are coded.

User Interface with AUX circuits for Alarm, Supervisory and Trouble - The 4004 provides for the following auxiliary circuits (negative output):

- Common Alarm output (on until reset and all fire zones clear). The Common Alarm output is supervised. [TB1-9]
- Common Trouble output (latched until all system troubles clear). [TB1-8]
- Common Supervisory output (on until reset and all supervisory zones clear). [TB1-7]

Four-Amp Signal Power Supply with Battery Charger - The system power supply is part of the system board. A cabinet mounted transformer connects to the system board. Different transformers are used for 120V and 220/240V operation. The system power supply provides all necessary system power and four amperes of signal power. Up to two amperes of auxiliary power is available from screw terminal connections. AUX power reduces available signal power. System power is calculated based on three zones in alarm (contact closure being worst case). If too much alarm current is drawn, the system is protected by removing loop power and alarms are latched in software. The system power supply detects earth faults and brown-out/over voltage conditions. The four-amp power supply battery charger charges 6.2 Ah or 10 Ah batteries needed for standby operation.

Back Box and Door - The back box for the 4004 mounts between two studs, 16 inches on center. Flush mounting or semi-flush mounting is possible with a left hinged door.

4004 Expansion Modules (Field Installed):

CAUTION: Power MUST BE REMOVED prior to installing or replacing expansion modules.

2-IDC Expander Module [565-575] (low current) -The 4004 supports only one 2-IDC expander module in a system. The 2-IDC expander module is used to expand the system to four or eight zones. Each module terminates for two Style B initiating circuits. Each circuit supports 2 mA of detector current (supervisory). Zone disconnect switches are provided on each IDC zone circuit. An open collector output for each circuit is activated on a short or current-limited condition. This output can drive and supervise a remote hardwired annunciator or auxiliary relay load (Air Products) of 150 mA. A 6.8K ohm EOL is required.

Note: Two 2-IDC Expander modules can *not* be used to expand a system to six zones – use one 4-IDC Expander Module.

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System Modules *(Continued)*

2-IDC Expander (Relay Base) [565-612] (high current) - This module is identical to the 2-IDC expander described above, except that it supports higher current initiating devices (3 mA) and it supports a single relay base. It also uses a 3.3 K Ohm EOL resistor that may be desired in retrofit applications.

4-IDC Expander Module [565-589] (low current) - The 4004 supports only one 4-IDC Expander module in a system. The 4-IDC Expander module is used to expand the system to six or eight zones. The module includes termination for four Style B initiating circuits. Zone disconnect switches and all IDC circuitry are included. Each circuit supports up to 2 mA of detector current (supervisory) or up to 30 compatible detectors at 50 μA each. An open collector output for each circuit is activated on a short or current-limited condition. This output can drive and supervise a remote hardwired annunciator or auxiliary relay load (Air Products) of 150 mA. A 6.8K ohm EOL is required.

4-IDC Expander (Relay Base) [565-613] (high current) - This module is identical to the 4-IDC expander (described above), except that it supports higher current initiating devices (3 mA) and it supports a single relay base. It also uses a 3.3 K Ohm resistor that may be desired in retrofit applications.

Class A IDC/NAC Adapter Module [565-585 or **565-789] -** This module converts two Style B IDCs to two Style D IDCs or two Style Y NACs to two Style Z NACs. Circuit supervision and alarm status currents are the same as for the Style B IDC. Circuit rating for a NAC remain two amperes.

City Connect Module [565-577] - This module has two circuits that can be configured for Municipal Master Box (Local Energy) or Remote Station (Reverse Polarity) type connections. Wiring to the city connect module is not power-limited and must be routed (refer to 519-698 wiring label) to preserve the power-limited integrity of the system. The specific configuration of the city connect module is selected using jumpers (See the *Jumper Settings/Service Switches* section of this chapter). The module has two circuits. The first circuit is used to signal a fire alarm condition which can be configured for Local Energy or Reverse Polarity operation. When configured for Reverse Polarity, the circuit de-energizes on a system trouble, if the second city circuit is configured for supervisory operation. By de-energizing, the module signals a trouble condition to the remote station. When the second city circuit is configured for trouble operation, the alarm circuit does not de-energize on a system trouble. When system troubles are signaled by de-energizing the alarm circuit, fire alarm conditions still signal providing city circuit wiring is intact.

City circuit two is configured for either Local Energy or Reverse Polarity operation. Select whether the circuit activates on a system supervisory or system trouble condition. The alarm circuit signals system troubles when the second city circuit is configured for supervisory activation.

Annunciator Interface Module [565-579] - This module is used to drive a hardwired LED type annunciator. Remote reset, acknowledge, and silence inputs are provided. Outputs for alarm silenced, system supervisory, and system trouble are provided. Zone alarm LEDs are driven from the system board or the IDC expansion modules. All inputs and outputs are supervised on the annunciator interface, 2-IDC, and 4-IDC modules.

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System Modules *(Continued)*

CCDACT Module [565-626] - The DACT Module uses the same CPU card connector as the City Connect Module, meaning a system may have either a DACT Module or a City Connect Module. A DACT trouble output will cause a 4004 system trouble, and is indicated on the seven segment display as a "City/DACT Trouble" ("C"). Mounting conforms to Power Limited requirements. The auxiliary Alarm output is on-until-reset. The trouble output is active until the trouble condition is cleared. The Supervisory output is active until the condition is cleared for all zones. The AC Fail signal delay is programmable on the DACT to delay reporting this condition.

Jumper Settings/Service Switches

The following selections are made jumper settable – see Figure 1 for jumper locations:

On Until Silence/Reset operation for each NAC.

1. Locate System Board jumpers P2 = NAC 1, P3 = NAC 2.
2. Jump P2-1 to P2-2 and P3-1 to P3-2 for "On Until Reset" operation.
3. Jump P2-2 to P2-3 and P3-2 to P3-3 for "On Until Silenced" operation. This must be selected for coded operations.

City Circuit configuration for optional City Connect module.

1. To configure City Circuits 1 and 2 as Local Energy or Remote Station, locate the City Connect module jumpers P2 - P5. Jump P2 - P5 as follows:

Table 1. Jumper Settings

Remote Station		
P2-2	to	P2-3
P3-1	to	P3-2
P3-3	to	P3-4
P3-5	to	P3-6
P4-2	to	P4-3
P5-1	to	P5-2
P5-3	to	P5-4
P5-5	to	P5-6

Local Energy		
P2-1	to	P2-2
P3-7	to	P3-8
P3-9	to	P3-10
P4-1	to	P4-2
P5-7	to	P5-8
P5-9	to	P5-10

2. Configuration of City Circuit 2 as supervisory, jump P6-1 to P6-2 and P6-3 to P6-4. Configuration of City Circuit 2 as trouble, jump P6-2 to P6-3.

Auxiliary Circuit Supervision:
To supervise AUX Zone 1 or AUX Zone 2 alarm outputs, clip JW1 on System Board for AUX Zone 1 and clip JW2 for AUX Zone 2.

To supervise AUX Alarm output clip JW3 on System Board.

To supervise AUX Zone Alarm outputs on Zones 3 through 8, remove JW1-JW4 on 4-IDC expander module and JW1 and JW2 on 2-IDC expander module.

IDC or NAC configuration for optional Class A converter module - Refer to Field Wiring Diagram 841-992 supplied with the FACP.

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Jumper Settings/Service Switches *(Continued)*

The 4004 has the following service switches for servicing and testing the system (see Figure 1):

Zone Disconnect Switch - "ON" for normal operation and "OFF" to disconnect zone. To disconnect a 4004 zone from a normal state, slide the Zone Disconnect Switch for any zone in alarm to the "OFF" position. this transfers the zone(s) from a normal condition to a zone disconnect trouble condition. Press the "ACK" key to acknowledge the trouble condition(s).

When restoring a zone to the operative state, activation of notification circuits is inhibited for 15-seconds. The system sounder and display is not delayed if the restored zone is in the alarm state. This allows the operator or service technician to restore the IDC to the disabled state without a general alarm. This operation is called "Abort Enable" of the IDC.

To disconnect a 4004 zone from an alarm state, toggle the Zone Disconnect Switch to the "OFF" position, then to the "ON" position, and once again to the "OFF" position. This transfers the zone(s) from a normal condition to a zone disconnect trouble condition. Press the "ACK" key to acknowledge the zone disconnect trouble condition(s). Press "SYSTEM RESET" to reset the system and clear the alarm outputs. A trouble is reported for any zone(s) in disconnect. Press the "ACK" key to acknowledge the trouble condition(s).
To re-connect a 4004 zone from the disconnect state, slide the Zone Disconnect Switch for the desired zone(s) to the "ON" position. Press "SYSTEM RESET" to clear the zone disconnect trouble condition(s).

City Disconnect Switch - "ON" for normal operation and "OFF" to disconnect. A system trouble indicates when the city is disconnected. There is a switch for each city circuit on the city connect module.

Alarm Output Disconnect Switch - This switch is used to disable all system alarm outputs. This includes NACs, Alarm City Circuit, Auxiliary Alarm Output, and Zone Alarm Outputs. When the switch is "OFF" the system is in the normal operation mode. When the switch is "ON" all of the above circuits are disabled. Trouble indications are indicated for each disabled circuit. Activation of this switch is ignored when the system is in alarm, you must clear Alarm and Reset conditions before switching back to the "OFF" position.

Walk Test Switch - "OFF" for normal operation and "ON" places the system in Walk Test mode. Activation of this switch "ON" allows one person to test the system. If system is in alarm the activation of the switch is ignored.

Program Switch - "OFF" for normal operation and "ON" places the system in the program mode. Activation of this switch is ignored if the system is in alarm.

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Programming Instructions

No special programming equipment is needed to configure the 4004 system. If no programming options are selected, the panel operates with the following default conditions:

- System configured for 8-IDC, CITY/DACT, Annunciator Interface.
- All IDCs are **FIRE** type, no Alarm Verification or Fire/Supervisory points.
- NAC 1 is coded Temporal until Silence (no cut out or inhibit).
- NAC 2 is on steady until Reset.
- Abnormal condition reminder active.

The 4004 panel is programmed for the desired mode of operation by using the seven-segment displays and the "ACK" and "SYSTEM RESET" keys for scrolling through programming options and set-ups. A switch (SW3) places the panel in the program mode. No alarms or troubles are processed when the panel is in the program mode.

The program switch is ignored if there are alarm conditions in the panel. Entering the program mode causes trouble indicated by a lowercase "h" on the yellow "TROUBLE" display. The user interface panel "ACK" key acknowledges the program mode trouble and silences the tone-alert. The "ACK" key selects configuration number and the "SYSTEM RESET" key selects the configuration option. Refer to Figure 4 for complete system programming configuration options.

1. Enter program mode by activating switch SW3. Tone-alert sounds until "ACK" key is pressed. A lowercase "h" is indicated on the yellow "TROUBLE" display.
2. Refer to Figure 4 for the following programming operation:
   - To scroll through the available program options press the "ACK" key.
   - To scroll through the available selections for each program option press the "SYSTEM RESET" key.
   - When desired programming is completed, exit the program mode by deactivating switch SW3. Program set-up is saved into non-volatile system memory and the lower case "h" on the yellow "TROUBLE" display clears. Write down program set-up in the "CURRENT SETUP" section on the 4004 door panel label.

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Programming Instructions
(continued)

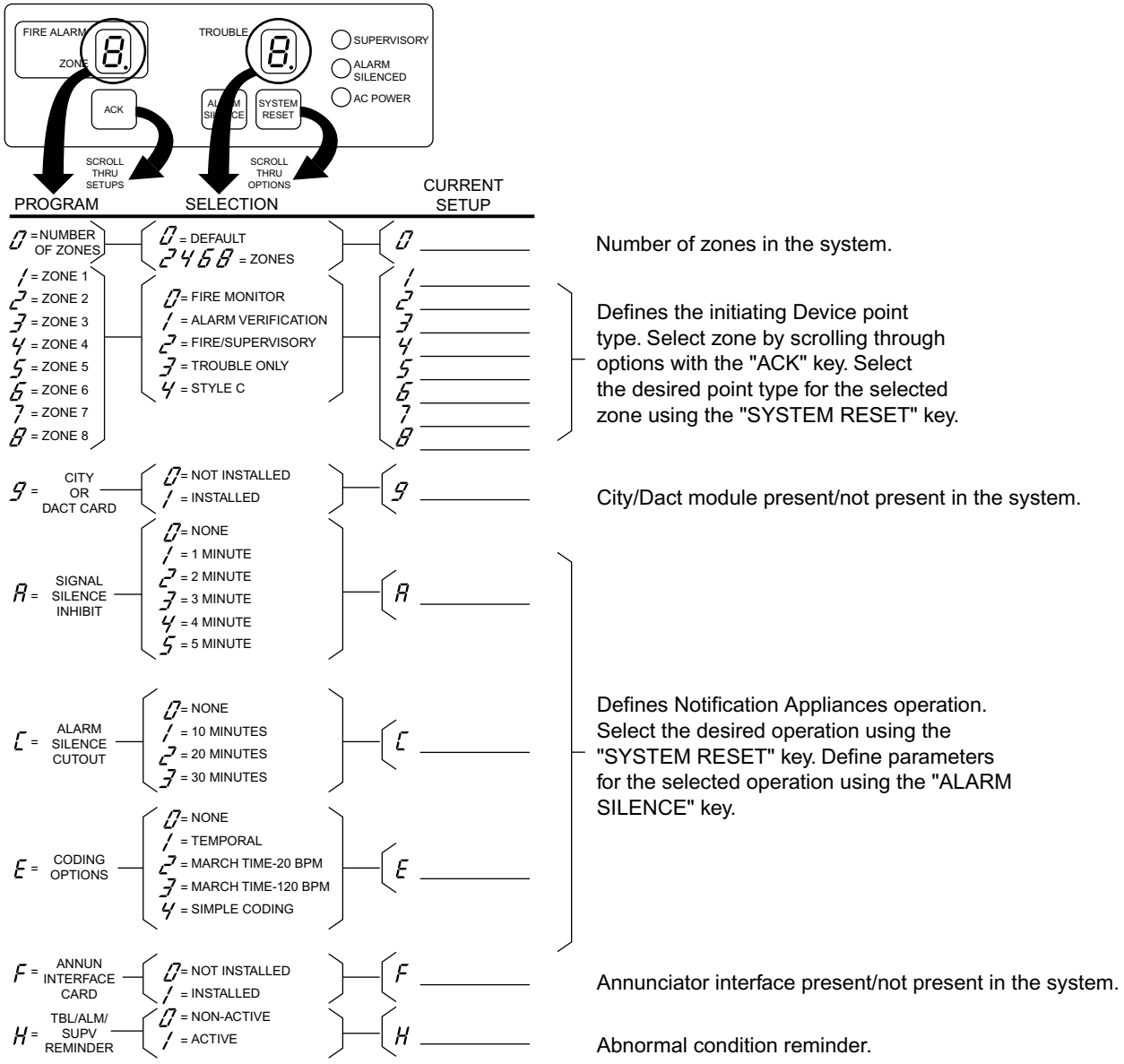
FIRE ALARM
ZONE
TROUBLE
SUPERVISORY
ALARM SILENCED
AC POWER
ACK
SYSTEM RESET
SCROLL THRU SETUPS
SCROLL THRU OPTIONS
PROGRAM
SELECTION
CURRENT SETUP
0 =NUMBER OF ZONES
0 = DEFAULT
2468 = ZONES
1 = ZONE 1
2 = ZONE 2
3 = ZONE 3
4 = ZONE 4
5 = ZONE 5
6 = ZONE 6
7 = ZONE 7
8 = ZONE 8
0= FIRE MONITOR
1 = ALARM VERIFICATION
2 = FIRE/SUPERVISORY
3 = TROUBLE ONLY
4 = STYLE C
Number of zones in the system.
Defines the initiating Device point type. Select zone by scrolling through options with the "ACK" key. Select the desired point type for the selected zone using the "SYSTEM RESET" key.
9 = CITY OR DACT CARD
0= NOT INSTALLED
1 = INSTALLED
City/Dact module present/not present in the system.
A = SIGNAL SILENCE INHIBIT
0= NONE
1 = 1 MINUTE
2 = 2 MINUTE
3 = 3 MINUTE
4 = 4 MINUTE
5 = 5 MINUTE
C = ALARM SILENCE CUTOUT
0= NONE
1 = 10 MINUTES
2 = 20 MINUTES
3 = 30 MINUTES
E = CODING OPTIONS
0= NONE
1 = TEMPORAL
2 = MARCH TIME-20 BPM
3 = MARCH TIME-120 BPM
4 = SIMPLE CODING
Defines Notification Appliances operation. Select the desired operation using the "SYSTEM RESET" key. Define parameters for the selected operation using the "ALARM SILENCE" key.
F = ANNUN INTERFACE CARD
0= NOT INSTALLED
1 = INSTALLED
Annunciator interface present/not present in the system.
H = TBL/ALM/ SUPV REMINDER
0 = NON-ACTIVE
1 = ACTIVE
Abnormal condition reminder.

Figure 4. 4004 Programming Selections

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Chapter 4
Operating Instructions

Front Panel Operation

The user interface consists of controls and indicators that provide support to 4004 fire alarm functions. The user interface indicates alarm, supervisory, trouble, power on, and alarm silenced conditions (shown in Figure 5). The purpose of the controls and indicators are in the *Operator Key Definitions* section of this chapter.

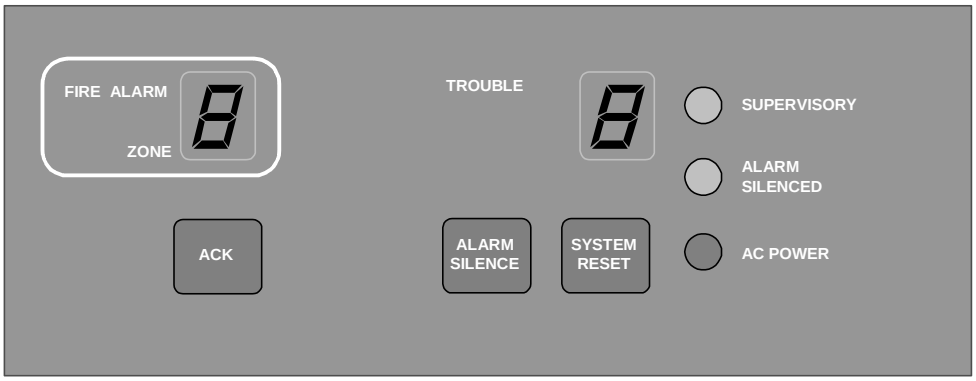

Figure 5. User Interface Panel

Operator Key Definitions

1. **Supervisory LED -** The yellow Supervisory LED, when ON, indicates that a zone programmed as Fire/Supervisory is in the current-limited state – not an alarm condition. To display the zone in the supervisory state, press the "ACK" key and view the zone number with decimal point on the red, seven-segment display.
2. **Alarm Silenced LED -** The yellow alarm-silenced LED indicates that the On Until Silenced notification appliances are OFF and that an alarm remains in the system.
3. **AC Power LED -** The green AC power LED indicates AC power is applied to the panel.
4. **Fire Alarm Zone Display** - The "FIRE ALARM ZONE" is a red, seven-segment display that is used to indicate alarms and supervisories. If a single zone is in alarm, the seven-segment display indicates the number of the zone in alarm. If two or more zones are in alarm at any time, the display slowly scrolls through the list of zones in alarm. The order of display follows the order in which the alarms were received. The decimal point indicates the start or end of an alarm list. Each alarm is displayed for two seconds. IDCs with a fire alarm condition are illuminated on the red fire alarm display ('1' through '8'). IDCs in a supervisory condition are illuminated on the display with a dot ('1.' through '8.'). The "ACK" key must be used to view supervisory conditions when the yellow Supervisory LED is illuminated.

Continued on next page

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Operator Key Definitions
(Continued)

5. **Trouble Display -** The "TROUBLE" LED is a yellow, seven-segment that is used to indicate IDC, NAC, City Circuit, Power Supply, AUX output, and various system trouble conditions. The IDC troubles are displayed using numerals 1 through 8, other troubles are displayed alphabetically (See Table 2 for a list of troubles indicated on the yellow "TROUBLE" display). The scrolling operation is identical as described in the "FIRE ALARM ZONE" display. If two or more trouble conditions are present, the display slowly scrolls through the list. If manual scrolling is desired, the "ACK" key scrolls through trouble indications sequentially after showing all alarms and supervisory points. Scrolling rotates between "Alarm", "Supervisory", and "Trouble" lists. Inactivity on the "ACK" key for ten seconds starts the scrolling sequence.

Table 2. Yellow Trouble Indicators

Indicator	Description
1 through **8**	IDC Zones
1. through **8.**	IDC AUX Output
A	Annunciator Card Trouble
A.	AUX Alarm Output
b	Battery Low
C	City/DACT Trouble
c	Configuration Trouble
d	Depleted/Disconnected Battery
E	NAC 1 Trouble
F	NAC 2 Trouble
H	Walk Test Trouble
h	Program Trouble
P	Power Supply Trouble
P.	Ground Fault Trouble

6. **System Reset Key -** The "SYSTEM RESET" key when pressed removes IDC loop power (two and four-wire) for 5 seconds. If all zones are clear, signals "On Until Silence" and "On Until Reset" are turned OFF. The "Alarm Silenced" LED and annunciator alarm outputs are turned OFF. When "SYSTEM RESET" is in progress, dashes (-) are displayed on the red (Fire Alarm) and yellow (Trouble) seven-segment displays.

7. **Acknowledge "ACK" Key -** The "ACK" key is used to acknowledge alarm, supervisory, and trouble conditions. Every system status change causes the tone-alert to sound until the "ACK" key is pressed. Each type of condition must be acknowledged via the "ACK" key, the tone-alert sounds until all conditions have been acknowledged. The "ACK" key acknowledges the type of conditions in the following priority: (1) Alarm, (2) Supervisory, and (3) Trouble.

Continued on next page

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Operator Key Definitions
(Continued)

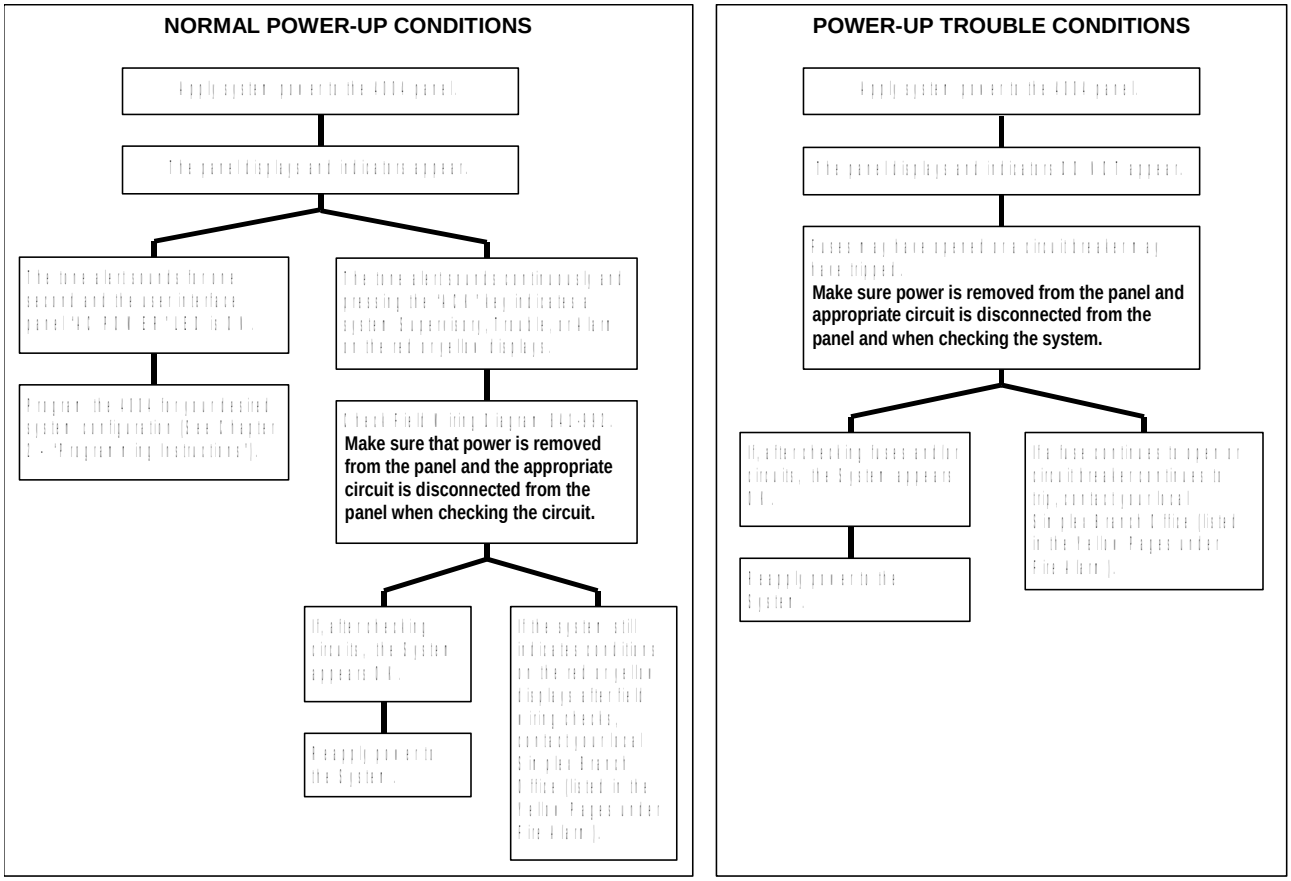
The "ACK" key is also used to perform a lamp test on the system LEDs and displays. When the "ACK" key is pressed for five seconds, the red and yellow, seven-segment displays (all segments), System tone-alert and Power On, Alarm Silenced, and Supervisory LEDs turn ON and remain ON until the "ACK" key is released.

8. **Alarm Silence Key** - The "ALARM SILENCE" key de-energizes NACs configured as "On Until Silence." The "ALARM SILENCED" LED turns ON and remains ON until all alarms are cleared.

System Initialization (Power-Up)

Follow the flow chart below to initialize the 4004 FACP.

IMPORTANT: Notify appropriate personnel (building occupants, fire department and/or monitoring facility, etc.) of power-up.


NORMAL POWER-UP CONDITIONS
Make sure that power is removed from the panel and the appropriate circuit is disconnected from the panel when checking the circuit.
POWER-UP TROUBLE CONDITIONS
Make sure power is removed from the panel and appropriate circuit is disconnected from the panel and when checking the system.

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Supervisory Conditions

A Fire/Supervisory point distinguishes between Fire Alarm and Supervisory conditions on a single circuit. When water is flowing in a sprinkler system, an Alarm is indicated, but if a sprinkler or water pump valve has been closed, a "SUPERVISORY" service condition is indicated. This condition is distinctly different from a trouble or alarm condition. The yellow "SUPERVISORY" LED flashes and the tone-alert sounds until the condition is acknowledged via the "ACK" key. After pressing the "ACK" key, the "SUPERVISORY" LED is ON steady, unless the user is scrolling (Supervisory is second priority). The supervisory state is only available on points configured as Fire/Supervisory type.

Walk Test ™

The 4004 is equipped with Walk Test, this feature allows one person to test the 4004 System. Walk Test is activated using the dedicated switch (SW4 on the System Board). The following conditions apply during Walk Test operation.

- Alarm - An alarm from an IDC is indicated with zone code notification over both NACs. If NACs are connected to strobes, the strobes may not indicate the zone code.
- Trouble - A trouble from any IDC, NAC, or an Earth Fault is indicated by activating NACs for four seconds.
- Walk Test switch is ignored if there is an alarm in the system.
- An upper case "H" on the yellow "TROUBLE" display indicates Walk Test trouble.
- City Circuit activation is not inhibited during Walk Test, it must be disconnected via the Disconnect Switches on the card.
- Display and tone-alert function as they would under normal conditions.
- Automatic system reset occurs within 30 seconds after Walk Test alarm.
- Subsequent alarms on the same zone causes another zone code (not a zero code).
- A "SYSTEM RESET" is done when exiting from Walk Test. Any zones still in an alarm condition initiate an alarm after the system reset.

System Testing (Fire Drills)

Fire Drills must be conducted periodically to ensure that the building occupants are familiar with emergency procedures and that all system equipment is functioning properly and is in good condition. This testing should be done under the direction of the owner and the local Authority Having Jurisdiction (AHJ).

System testing is initiated when the following considerations have been determined:

- How does the owner and AHJ want the drill or test performed?
- Is the building occupied?
- Which system features are currently in use?

If a building is not occupied and no city connection or DACT are used, there is less concern that confusion will result from testing the system. Systems connected to a city circuit must notify the local AHJ. The AHJ determines if the city connection should be disabled during the test.

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System Testing (Fire Drills)
(Continued)

The optional city module has disconnect switch(s) SW1 (City Circuit 1) and SW2 (City Circuit 2) that disables the city circuit if desired. If the AHJ wanted to test the city box, the city circuit disconnect switch(s) would not be enabled. A system wired with the optional DACT module must have system testing coordinated with the Central Station operator and the AHJ.
To initiate a test with the 4004, activate an initiating device (pull station, smoke detector etc.). The test simulates a real alarm condition. This allows the building occupants to become familiar with the conditions encountered in an actual fire emergency condition.

Emergency Operating Instructions

If the 4004 Fire Alarm System has an Alarm, Supervisory, or Trouble condition, refer to Figure 6 for Emergency Operation procedures.

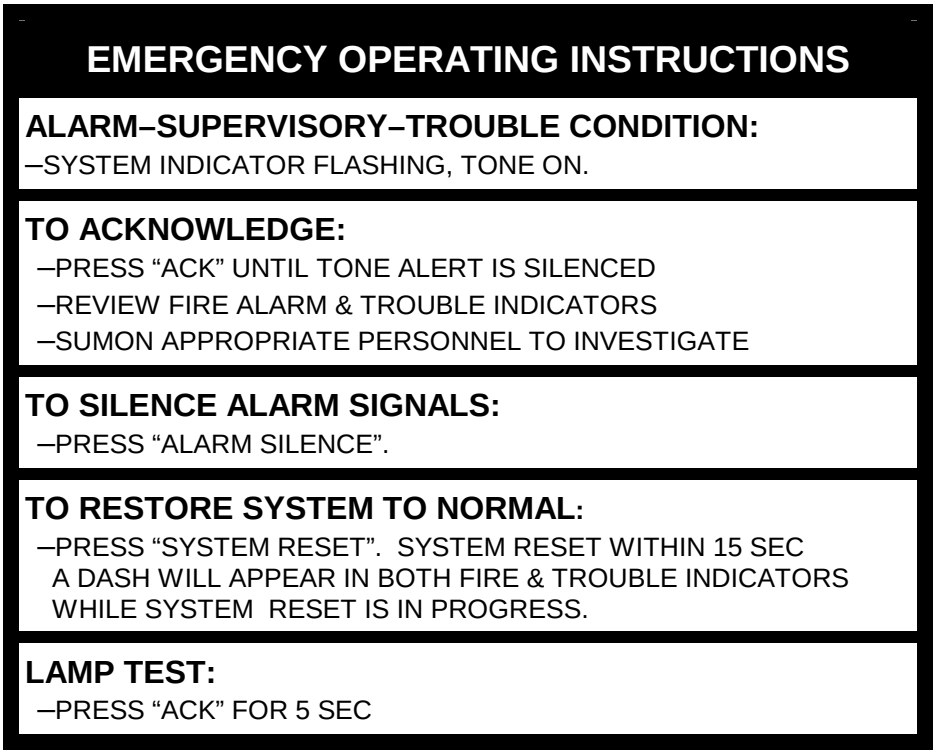
EMERGENCY OPERATING INSTRUCTIONS
ALARM–SUPERVISORY–TROUBLE CONDITION:
–SYSTEM INDICATOR FLASHING, TONE ON.
TO ACKNOWLEDGE:
–PRESS “ACK” UNTIL TONE ALERT IS SILENCED
–REVIEW FIRE ALARM & TROUBLE INDICATORS
–SUMON APPROPRIATE PERSONNEL TO INVESTIGATE
TO SILENCE ALARM SIGNALS:
–PRESS “ALARM SILENCE”.
TO RESTORE SYSTEM TO NORMAL:
–PRESS “SYSTEM RESET”. SYSTEM RESET WITHIN 15 SEC
A DASH WILL APPEAR IN BOTH FIRE & TROUBLE INDICATORS
WHILE SYSTEM RESET IS IN PROGRESS.
LAMP TEST:
–PRESS “ACK” FOR 5 SEC

Figure 6. Emergency Operating Instructions

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Chapter 5
Glossary of Terms

Glossary of Terms

Alarm - A warning of fire danger.

Alarm Signal - A signal indicating an emergency requiring immediate action, such as a signal indicative of fire.

Alarm Verification - A feature to reduce unwanted alarms wherein smoke detectors must report alarm conditions for a minimum period of time. Alarm Verification also confirms alarm conditions within a given time period, after being reset to be accepted as a valid alarm initiation signal.

Annunciator - A unit containing two or more indicating lamps, alpha-numeric displays, or other equivalent means in which each indication provides status information about a circuit, condition or location.

Authority Having Jurisdiction - The "Authority Having Jurisdiction" is the organization, office or individual responsible for approving equipment, an installation, or a procedure.

Class A - A four-wire method of connecting IDC or NAC that guarantees operation with a single open conductor. *See Style D (IDC) and Style Z (NAC).*

Class B - A two-wire method of connecting IDC or NAC that causes a trouble indication with an open circuit. *See Style B (IDC) and Style Y (NAC).*

Current-Limited IDC State - A "current-limited" state exists when an initiating device shunts a resistor across the IDC. For the 4004 system, this resistor is defined as 400-820 ohms.

Digital Alarm Communicator Transmitter (DACT) - A system component at the protected premises to which initiating devices or groups of devices are connected. The DACT seizes the connected telephone line, dials a pre-selected number to connect to a Digital Alarm Communicator Receiver (DACR), and transmit signals indicating a status change of the initiating device.

Display - The visual representation of output data other than printed copy.

Evacuation - The withdrawal of occupants from a building.

Evacuation Signal - A distinctive signal intended to be recognized by the occupants as requiring evacuation of the building.

FACP - Fire Alarm Control Panel. A system component that receives input from automatic and manual fire alarm devices and may supply power to detection devices and transponders or off-premises transmitters. The control panel can provide transfer of power to the notification appliances and transfer of conditions to relays or devices connected to the control panel. The FACP can be a local fire alarm control panel or a master control panel.

Fire/Supervisory - An IDC point type that is zone selectable. This point type initiates a "Supervisory Abnormal" condition at the FACP if a current-limited state is detected.

Heat Detector - A device that detects abnormally high temperature or rate of temperature rise.

Continued on next page

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Glossary of Terms *(Continued)*

Initiating Device - A system component that originates transmission of a change of state condition, such as a smoke detector, manual fire alarm box, supervisory switch, etc.

Initiating Device Circuit (IDC) - A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated.

Labeled - Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization acceptable to the "Authority Having Jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production labeled equipment of materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed - Equipment or materials included in a list published by an organization acceptable to the "Authority Having Jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

March Time Code - A notification code that consists of a 50% duty cycle pulse train. The march time rate is specified in beats per minute (BPM). A 20 BPM March Time Code consists of 20 ON/OFF cycles in one minute.

Municipal Master Box - An indicating device intended to send an alarm condition to the public fire service communication center.

Normal State (IDC) - The normal state is defined as the end of line resistor in place with the full range of line resistance and detector load.

Notification Appliance - A fire alarm system component such as a bell, horn, strobe, etc., that provides an audible or visible output, or both.

Notification Appliance Circuit (NAC) - A circuit or path directly connected to one or more notification appliances.

Open Circuit State (IDC) - An open circuit is defined as the absence of the end-of-line resistor, with or without a detector load.

Protected Premises - The physical location protected by a fire alarm system.

Remote Station Circuit - A circuit intended to send alarm, supervisory, and/or trouble signals to a remote location at which appropriate action is taken.

Short Circuit IDC State - A short circuit exists when an initiating device shunts a low resistance contact across the IDC. The contact resistance is defined as 0-200 ohms.

Simple Code - A code consisting of a distinct number of pulses used to indicate which zone (IDC) is in alarm. The number of pulses is the same as the number assigned to the zone in alarm.

Smoke Detector - A device that detects visible or invisible particles of combustion.

Continued on next page

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Glossary of Terms *(Continued)*

States - The state of an IDC is determined by the physical condition of the wiring and devices connected to the terminal block. There are four states associated with an IDC:

- Short (0-200 ohms).
- Current-limited state (400-820 ohms), across the initiating device circuit.
- Normal state (defined as the end-of-line resistor in place with the full range of line resistance and detector load).
- Open circuit state (defined as the absence of the end-of-line resistor, with or without a detector load).

Style B - A method of connection for IDC that provides a trouble indication in the event of an open circuit on the wiring loop (also known as Class B).

Style C/Style E - An IDC point type. A trouble indication is provided if a short (plus to minus) or open circuit condition exists on the wiring loop. An alarm is initiated if a "current-limited" state exists. Style C is two-wire, Style E is four-wire.

Style D - A method of connecting initiating devices on IDCs that provide multiple signal paths so that circuit operation is maintained with a single open circuit connection. A trouble indication is provided in the event of an open circuit on the wiring loop (also known as Class A).

Style Y - A method for connecting notification appliances on NACs that provide a trouble indication in the event of an open circuit on the wiring loop (also known as Class B).

Style Z - A method of connecting notification appliances on NACs that provide multiple signal paths so that circuit operation is maintained with a single open circuit connection. A trouble indication is provided in the event of an open circuit on the wiring loop (also known as Class A).

Supervisory Signal - A signal indicating the need of action in connection with the fire suppression system or equipment, or with the maintenance features of related systems.

Temporal Code - A three coding pulse pattern adopted by NFPA as a standard evacuation pattern for audible notification. The pattern consists of three, 0.5-second pulses, each pulse separated by 0.5-second silence. Each group of three pulses is separated by 1.5-seconds of silence.

VSMOKE - A point type that is selectable for an IDC. This point type initiates an immediate alarm from a contact closure Pull Station or Heat Detector, but initiates the Alarm Verification sequence (see definition above) for a current-limited alarm. A point configured as VSMOKE must not have any devices other than smoke detectors that initiate a current-limited alarm.

Zone - A defined area within the protected premises. A zone may define an area from which a signal can be received, an area to which a signal can be sent, or an area in which a form of control can be executed.

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Chapter 6
4004 Battery Selection

Battery Selection

60 Hours of Standby Operation Followed by Ten Minutes of Alarm - With 10 Ah batteries, a fully configured 4004 Fire Alarm System supplies at least 60 hours of standby operation, followed by ten minutes of alarm operation, when four-wire detectors or non-alarm loads are **not** connected to the system.

24 Hours of Standby Operation Followed by Ten Minutes of Alarm - With 6.2 Ah batteries, a fully configured 4004 Fire Alarm System supplies at least 24 hours of standby operation, followed by ten minutes of alarm operation, when four-wire detectors or non-alarm loads are **not** connected to the system.

4004 Fire Alarm System with 4-Wire Detectors or Non-Alarm Loads – When four-wire detectors or non-alarm loads are required, complete the battery calculation equation in Table 4 to determine 4004 battery selection requirements.

Table 3 provides the Supervisory Current requirements for various modules.

Table 3. Module Supervisory Currents (Nominal)

Module	Supervisory Current
Standard Panel	52 mA
4004-9802, 2 Pt. IDC, Low Current	7 mA
4004-9804, 4 Pt., Low Current	14 mA
4004-9822, 2 Pt. IDC, High Current	14 mA
4004-9824, 4 Pt. IDC, High Current	27 mA
4004-9806, Class A Adapter	N.A.
4004-9808, Annunciator Interface Module	4 mA
4004-9809, 2 Circuit Remote Station/City Connect	12 mA
2080-9045 DACT	35 mA

Note: Add all NAC Appliances and IDC Devices for total.

Continued on next page

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Battery Selection Calculation

Table 4. Battery Selection Calculation

1	Enter total supervisory current from all cards in system (See Table 3)	_____Amps	
2	Enter total Auxiliary power current draw in standby (See Note 1, below)	_____Amps	
3	Enter total two-wire detector current draw in standby (See Note 2, below)	_____Amps	
4	**ADD** lines **[1]**, **[2]**, and, **[3]** (Total standby current)		**=**_____Amps
5	Enter the required hours of standby	_____Hr	
6	**MULTIPLY** line **[4]** by line **[5]**		**=**_____Ah
7	Enter the total NAC/AUX alarm current	_____Amps	
8	**MULTIPLY** line **[7]** by **.083** for five minutes of alarm **–or–** line **[7]** by **.167** for ten minutes of alarm		**=**_____Ah
9	**ADD** lines **[6]** and **[8]**		**=**_____Ah

- ***If the total in line [9] is less than or equal to* 5.1*, use 2081-9272 6.2 Ah batteries.***
- ***If the total in line [9 is greater than* 5.1 *and less than or equal to* 8.3*, use 2081-9274 10 Ah batteries.***
- ***If the total in line [9 is greater than* 8.3*, the 4004 charger is not capable of charging larger capacity batteries. Consider using the 4004 with a 4009 NAC Power Extender or a 4005 Fire Alarm Control Panel.***

Notes:

1. All Auxiliary loads subtract from the total 4.0 Amps of power available on the 4004. As an example:
   Total Available NAC power = 4.0 Amps
   Total Available AUX power = 2.0 Amps
   Total COMBINED power = 4.0 Amps
2. Standby current is listed on Detector Data Sheets. Maximum standby current draw on the “low current” IDC is 2 mA per zone. Maximum standby current draw on the “high current” IDC is 3 mA per zone. Refer to UL's two-wire detector compatibility listing for compatible models and maximum quantity of two-wire detectors per zone.

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Simplex

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